

Abutilon menziesii 2011-2012 Status Report



By Greg Mansker, Horticulturist, Hawaii Department of Land and Natural Resources
August 2012

I. Introduction

A population of *Abutilon menziesii* was discovered in late 1996 at Kapolei in the Ewa area, island of Oahu, on former sugarcane land. *Abutilon menziesii* has been a federally listed species since 1986. This population was located within the footprint of a Department of Transportation road and as a result, a Habitat Conservation Plan (HCP) for *Abutilon menziesii* at Kapolei was completed to mitigate for the effects of development on this population (November 2003). The HCP outlines the measures planned over the next 20 years. The goal of the HCP is to initiate and sustain a program which would result in an overall net gain in the number of *Abutilon menziesii* on Oahu. The end goal is the establishment of three protected off-site populations on Oahu from the single degraded Kapolei population. This 2011-2012 status report serves as a way of monitoring the progress towards this end goal.

The main focus for 2011-2012 was to re-vegetate the Contingency Reserve Area with common natives to attempt to reduce the weed pressure around the Abutilon. Another major focus was pursuing several new options for outplanting sites.

Propagation of select rare coastal species continued during this reporting period. A total of 337 rare coastal plants were outplanted in joint projects with the Papahanaumokuakea National Marine Monument, Camp Mokuleia, Camp Erdman, Friends of Kaena Point, and Paiko Lagoon Restoration project.

II. Population Summaries

A. Diamond Head

In 2004, an MOU was established with the Hawaii State Parks and the Hawaii Army National Guard to establish an *Abutilon menziesii* population. One-hundred and four plants were outplanted in September 2004 representing 65 % of the genetics from the Kapolei population. A low flow, low maintenance irrigation system is in place that utilizes the municipal water supply. The only [plants on irrigation are new outplantings. The planting strategy used at this site was to plant the plants close together with high rates of fertilization and water to help the plants out compete the weeds and fill the area with a continuous stand of *Abutilon menziesii*. This has resulted in a very healthy population of *Abutilon menziesii*. The thought behind this strategy is that by getting the plants off to a healthy start, a seed bank will be established early on in the process. A firebreak was established around the perimeter of the population using plants that were present in the nursery in excess numbers. Groundcover was established for fire and weed control purposes using the following native species: *Vitex rotundifolia*, *Rauvolfia sandwicensis*, *Lipochaeta lobata*, *Sida fallax*, and *Sesbania tomentosa*.

During 2011-2012, no new plants were outplanted. There are a total of 80 plants at Diamond Head representing 77% of the Kapolei genetic stock. This site is currently monitored once a month and selectively weeded (i.e. weeding only the high threat species). This weeding strategy emphasizes control versus elimination. Of the 28 seedlings seen during 2008-2009, 15 seedlings have survived for over two years. Two of the seven seedlings that emerged during the 2010-2011 season survived one year. During 2011-2012, 1 seedling emerged. The goal for 2012-2013 is to maintain and monitor the outplantings and seedlings.

B. Koko Crater Botanical Garden

The plants at Koko Head Botanical Garden are thriving. Originally, there were 62 plants representing 46 lineages at this site. During 2011-2012 the focus of work was to improve the irrigation system. Seven new plants were outplanted, increasing the genetic stock represented by 10%. Currently, 66% of the genetic stock is represented at this site. The plants located at Koko Head are an invaluable source of working material for the program (i.e. cuttings, seeds, etc). This is a good example of how botanical gardens and various forestry programs can and should work together towards recovery of rare species. The goal for 2012-2013 is to continue to add more plants and expand the site to include a repository for *Schiedea adamantis*.

C. Honouliuli

The Honouliuli outplanting site is located along the western edge of the West Loc of Pearl Harbor and was established in 2002 and 2003. This site is within three to four miles of the original population and is very well protected. The site itself is part of the Oahu National Wildlife Refuge Complex. The refuge consists of 37 acres of fenced land, much of which is occupied by two ponds. The land itself is still under Navy ownership but USFWS has a cooperative agreement with the Navy to manage the site as a refuge in perpetuity. There are two separate areas being used for outplanting within the refuge. The first consists of a narrow strip, approximately 20 by 600 feet, while the second site is approximately 60 by 300 feet. The first planting commenced on March 15, 2002 in the 20 by 600 foot site. Work at the second location began January of 2003. The new location is about 500 yards south of the first outplanting site. The plants at Honouliuli are healthy and the site is showing promise.

Both locations are on an irrigation system (only used for new outplantings) and are managed entirely by the State of Hawaii Forestry and Wildlife staff. Efforts are being made to adjust the conditions of the soil at both sites so that they are more favorable for regeneration and growth. This site is monitored twice a month. Access is an issue at this site due to bird nesting and the usage by school groups for outdoor education. There are 10 seedlings that have survived more than three years. There are 118 seedlings that have survived for over 2 years. No seedlings emerged during this reporting period. The survival of the seedlings will be tracked again during 2012-2013. This site has reached capacity; therefore, the only plantings planned in the future are for replacement of plants that die. During 2011-2012, no plants senesced, therefore, no new plants were outplanted. Although all plants at this site produce seeds, a large percentage of the plants are also reproducing vegetatively by mounding (i.e. lower branches root on contact with the ground). As of 2012, there are a total of 75 adult plants representing 52% of the genetic stock available.

D. Ewa Villages Golf Course

The Ewa Villages Golf Course is located adjacent to the original wild *Abutilon* site. The Ewa Villages Golf Course population is located within 125 yards of the original wild site; which was the primary reason for choosing this location. Even though this is not a “wild” situation, it is an undisturbed, protected site with favorable conditions, much like the original wild site. Irrigation is present at this site. This site is monitored once a month. No additional plants were planted in 2011-2012. There are currently 74 total plants at this site representing 70% of the genetic stock available. The goal for 2012-2013 is to increase the genetic representation with additional number of outplantings; however, this site is reaching capacity.

E. Contingency Reserve Area

During 2005-2006, 35 plants were moved to the Contingency Reserve Area (CRA). Only one plant was lost during the move. Once the plants were moved, a perimeter fence was installed by the Department of Transportation contractors around the CRA site. A firebreak was also installed prior to the construction of the fence. The firebreak consists of a weed free gravel barrier. The perimeter fence and firebreak require regular and consistent weed control. During 2006-2007, one of the plants that had been previously moved to the CRA died. Unfortunately, this was one of the new plants located in 2002 and it is not represented in any of the outplanting sites or in genetic storage.

On October 31, 2005, a small fire occurred in the CRA taking out approximately one acre. The fire was quickly contained and no *Abutilon* were damaged. A meeting was held with the Waipahu/Ewa Fire Department at the CRA site to determine possible wildfire issues and to familiarize them with the site.

Weeds are a huge problem at this site. During 2011-2012, a considerable amount of time was spent installing common native plants to adjust the light regime to make it less favorable for grass growth. Over 1,000 plants were planted in a half acre area. Species include *Dodonea viscosa* (*aalii*), *Chenopodium oahuense* (*aheahea*), *Gossypium sandwicense* (*mao*), *Achyranthes splendens*, *Myoporum sandwicense* (*naio*), *Sapindus oahuensis* (*Ionomea*), and *Pritchardia* sp. (*loulu*). Approximately 75% of the 21 acre site was also mowed and sprayed with herbicide to control weeds. The site has been heavily impacted by dust from the construction in the surrounding area. Four plants were lost this year, most likely from the dust. During August 2012, Department of Transportation officials visited the site and will be working to address the issue.

There are a total of 59 plants representing 56% of the genetic stock at this site. The goal for 2012-2013 is to continue outplanting additional plants and continue habitat restoration.

F. Pouhala Marsh

The Pouhala Marsh population is located on City and County property in Waipahu. During April 2007, 63 plants were outplanted, of which half were lost due to tidal fluctuations within the marsh. During 2010-2011, 17 additional *Abutilon menziesii* were outplanted. Currently, there are 43 plants representing 41% of the Kapolei population genetics. Weeds are not really a major problem at this site. The benefit of this site is the opportunity for community involvement and education because the site is so accessible. Management of this site is a cooperative effort between various Division of Forestry and Wildlife Branches and the Research Corporation of the University of Hawaii staff. The goal for 2012-2013 is to continue to increase the representation of the Kapolei plants at this site.

G. Additional Sites

During 2011-2012, contact was made with three additional landowners (Pioneer Hybrid Seed, Gill Olsen Joint Venture, and State Department of Agriculture) regarding use of their property for *Abutilon* outplantings. After conducting a site assessment, a formal proposal was submitted to Pioneer Hybrid Seed of Waialua. The proposal is for a new outplanting site of approximately 5-acres. DLNR is currently waiting to hear back from the land owner on the proposal. During 2012-2013, time will be spent continuing to work with these land owners for access.

III. Greenhouse

A. Construction

The greenhouse established for *Abutilon menziesii* is located near the base of the Kealia Trail head, just behind the western end of Dillingham Airstrip in Mokuleia. The initial structure was completed in December 2002. The greenhouse is 130 feet long by 40 feet wide by 12 feet tall. It is divided into an upper and a lower section along the entire length and has gravel floor. The site contains two separate Matson container type storage facilities, one is used as office space. The site also contains an additional raised 8-foot by 32 foot storage facility was completed inside the greenhouse structure. During 2011-2012, typical greenhouse upkeep included building and road maintenance, such as repairing the watering system, repairing damage from rock falls, and weeding. Currently, work is being done installing two additional 4 feet by 16 feet benches.

B. Propagation

Propagation of select common and rare coastal species including *Sesbania tomentosa* (ohai), *Achyranthes splendens* var. *rotundata*, *Chenopodium oahuense*, *Eragrostis variabilis* (kawelu), *Tribulus cistoides* (nohu), *Scaevola taccada* (naupaka), *Sporobolus virginicus* (akiaki), and *Vigna marina* (nanea) is ongoing. An accounting can be found in Table 3 below.

Table 3. Rare and Common Coastal Species Outplantings by Location

Species	Camp Erdman	Kaena Pt. State Park	Kaena Point NAR	Pouhalo Marsh	Paiko Lagoon	Total
<i>Sesbania tomentosa</i>	64	136	36	8	22	266
<i>Vigna marina</i>		20				20
<i>Sporobolus virginicus</i>		20				20
<i>Chenopodium oahuense</i>				8	15	23
<i>Scaevola taccada</i>					10	10
<i>Achyranthes splendens</i>				8		8

During this reporting period, work continued in cooperation with the Oahu Plant Extinction Prevention Program (OPEP) on *Schiedea adamantis*. This species' distribution is restricted to Diamond Head. The small greenhouse site established within Diamond Head crater in 2009-2010 for growing this species was maintained. There are currently 50 plants in propagation. These plants were started from seeds provided by OPEP. The hope is that growing the plants in Diamond Head will allow them to sufficiently harden off prior to being outplanted back onto the crater walls. This location also limits the chances for inter breeding with other *Schiedea* species. During 2011-2012, time was spent visiting the wild site and conducting outplanting trials at Diamond Head within the crater.

During this reporting period, time was spent working on the development of the HCP for *Achyranthes splendens* var. *rotundata* in the Kenai Industrial Park project area. Work included observation, collection, and propagation of the wild plants. Currently, there are 3 plants from cutting and three from seeds housed in the greenhouse. Over 1,000 seeds were collected during the reporting period from the plants in the greenhouse.

An ongoing goal of the program, is to continue to collect and propagate *Abutilon menziesii* plants found at the outplanting sites and/or the CRA at Kapolei that were not represented with stock on hand at the Mokuleia nursery. In other words, filling in the gaps between plants on hand at the nursery and plants in the field, which are not represented in the nursery stock. These gaps are due to the time needed for the construction of the Mokuleia nursery, during which there was no propagation of plants. This was due to the lack of facilities to grow and care for them and the time that was needed to complete the greenhouse and the HCP.

IV. Summary

Table 4. Status of *Abutilon menziesii* populations

	Koko Head	CRA	Honouliuli Reserve	Ewa Villages	Pouhalo Marsh	Diamond Head	Total
Mature	95	58	61	74	52	80	435
% Genetic Representation	66%	56%	52%	72%	41%	77%	100%
Seedlings 2004 (Natural Regeneration)	N/A	N/A	0	N/A	N/A	N/A	0
Seedlings 2005 (Natural Regeneration)	N/A	N/A	0	N/A	N/A	N/A	0
Seedlings 2006 (Natural Regeneration)	N/A	N/A	1	N/A	N/A	0	1
Seedlings 2006 (Natural Regeneration)	N/A	N/A	0	N/A	N/A	0	0
Seedlings 2007 (Natural Regeneration)	N/A	N/A	0	0	N/A	6	6
Seedling 2008 (Natural Regeneration)	N/A	N/A	2	0	0	28	30
Seedling 2009 (Natural Regeneration)	N/A	N/A	26	N/A	N/A	5	31
Seedling 2010 (Natural Regeneration)	N/A	N/A	0	N/A	N/A	0	0
Seedling 2011 (Natural Regeneration)	N/A	N/A	159	N/A	1	7	167
Seedling 2012 (Natural Regeneration)	N/A	N/A	0	0	0	1	1
Survival of Seedlings (0 mon.-1 yr.)	N/A	N/A	0	N/A	1	0	1
Survival of Seedlings (over 1 yr.)	N/A	N/A	0	N/A	N/A	2	2
Survival of	N/A	N/A	118	N/A	N/A	15	133

Seedlings (over 2 yr.)							
Survival of Seedlings (over 3 yr.)	N/A	N/A	10	N/A	N/A	0	10

A. Accomplishments for 2011-2012

- Added additional founders to Koko Crater.
- Outplanted over 1,000 common natives at the CRA
- Conducted intensive weed control on 15 acres of the 21-acre CRA
- Monitored and weeded all previous outplanting site.
- Provided horticultural expertise to Camp Mokuleia and Camp Erdman
- Air Layers were collected from the Ewa Villages Golf Course and Koko Head.
- Continued collecting and propagating other rare coastal species in the greenhouse.
- Outplanted 337 rare coastal plants
- Provided rare and common coastal species for public restoration projects to 3 groups
- Investigated additional planting sites on three separate parcels

B. Goals for 2012-2013

- Continue pursuing additional planting sites
- Continue extensive revegetation of the CRA
- Complete the tracking database for the project.
- Ensure that at least one (as many as possible given space availability) of every Kapolei plant is represented in at least one of the outplanting sites.
- Continue to monitor and maintain the plants at all sites.
- Continue to survey for and collect from rare coastal species.
- Continue to outplant rare coastal species within the *Abutilon* populations.
- Expand existing range of *Sesbania tomentosa*.
- Continue to outplant rare coastal species.
- Continue work on *Schiedea adamantis*.